

**DIRECTORATE GENERAL BORDER SECURITY FORCE**  
**COMN&IT DIRECTORATE (EQPT CELL)**

**EXPRESSION OF INTEREST**

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Technical Board of Officers constitution by BSF to formulate the Qualitative requirements & Trial Directives of Border Flood Light Control System for integration with Command and Control Centre.

**QUALITATIVE REQUIREMENTS (QRs/ SPECIFICATIONS) AND TRIAL DIRECTIVES FOR “BORDER FLOOD LIGHT CONTROL SYSTEM FOR INTEGRATION WITH COMMAND AND CONTROL CENTRE**

Trial/ technical evaluation of equipment will be conducted by a Board of Officers (B.O.O) in presence of Vendor or representative of Firm to assess actual performance of the instrument.

All specifications / parameter of Equipment mentioned in the QRs will be checked by B.O.O during Trial by ascertaining/ verifying following ways:

- i) **PHYSICAL CHECK**:- In this category specifications of the equipment will be checked by B.O.O. Physically as per QRs.
- ii) **FUNCTIONAL CHECK**:- In this category Vendor/ Supplier will show practically all features/ configuration shown against to the board of officers during trial.
- iii) **SUBMISSION OF CERTIFICATE**:- Specification which cannot be checked due to lack of testing facilities/ expertise, certificate provided by the vendor issued by a Government Authorized Laboratory or OEM as specified against the parameter, will be acceptable by B.O.O. during trial.

iv) **POC (PROOF OF CONCEPT) :-** Vendor will give a functional demonstration of the system for a minimum test patch of 5 poles at a given site which include all associated eqpt, software and display during the time of technical/ physical evaluation.

The following are the Qualitative Requirement and Trial Directives for the sub system for “Border Flood light control system for integration with C2 centre”.

| <b>(i) STREET LIGHT CONTROLLER WITH RF BASED COMN MODULE:</b> |  |   |
|---|--|---|
| <b>S/ No.</b>   | <b>TECHNICAL SPECIFICATION</b>   | <b>TRIAL DIRECTIVES</b>   |
| 1   | Should have the provision of accurate power monitoring along with remote control of street lights using a built-in RF module that can be used as a repeater, router or transmitter of the RF signal from other wireless nodes. | System to be physically checked by BOO.   |
| 2   | Should have unique ID and to transmit signalling with data and the ID number which should be programmable in the controller.   | Feature to be physically verified by BOO.   |
| 3   | Should have the feature to program before field installation.  | System to be physically checked by BOO.   |
| 4.  | Should have the facility to program; Mode of operation, Current date & time, Cause of alarm and Schedule information.  | Feature to be physically verified by BOO.   |
| 5.  | Should have facility to store all electrical parameter in the memory with time stamping at defined login interval and generated in Microsoft excel format or similar at central command control.                               | Feature be physically verified by BOO.  |
| 6.  | <u>Installation:</u> should be plug & play.  | System to be physically checked by BOO.   |
| 7.  | Controller must support at least 5 lamp control modes (user configurable) ON/OFF/DIM schedules on daily/ monthly/ events etc.  | System to be physically checked by BOO.   |
| 8.  | <u>Digital Metering:</u> Should be provision to monitor accurate Voltage, Current, Power Factor etc as per the IEC standard  | Feature to be physically verified by BOO.   |
| 9   | Should have the facility of photo cell to operate as per sunset/ sunrise conditions.   | System to be physically checked by BOO.   |
| 10  | Should have the facility to operate on sensor input.   | System to be physically checked by BOO by stimulating one available sensor (Analog /Digital). |

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| 11 | Should have the facility of RTC (Real Time Clock) with power backup for independent operation.   | Feature to be physically verified by BOO.  |
| 12 | Should have the facility to configure/ commissioning/ fault maintenance through hand held configurator.  | System to be physically checked by BOO with the hand held configurator.                |
| 13 | <u>Fault Monitoring</u> : System should have Extensive fault monitoring features that reports lamp burn outs, lamp cycling, ballast failure, over/under voltage, abnormal power consumption, low power factor, communication failure and more. All faults are sent to the Management System that generates alarms for visualization and fault rectification. | All the Feature to be physically verified by BOO through Management System software    |
| 14 | <u>Burn Hours</u> : The controller keeps track of lamp burn hours for predictive maintenance, allowing proactive lamp replacement.   | The Feature to be physically verified by BOO through Management System software        |
| 15 | <u>High Reliable and Robust Communication Network</u> : Lighting Controllers installed on Individual LED Luminaries must communicate with the Gateway over a wireless network which could use a standard ZigBee Pro mesh network protocol which is an open and interoperable standard that is based on IEEE 802.15.4.  | The Feature to be verified by BOO through OEM certification and spec sheet of product  |
| 16 | Should be UL773 and CE certificate for electrical parameters   | Lab Certificate to be submitted by the firm for confirmation of specs.                 |
| 17 | Zig-B or any equivalent comn mode should be FCC certificate.   | Lab Certificate to be submitted by the firm for confirmation of specs.                 |
| 18 | Metering Accuracy 2%, Certified as per IEC standard  | Lab Certificate to be submitted by the firm for confirmation of specs.                 |
| 19 | Switching Capacity 15A maximum. Relay should be inrush current rating of 110A  | The Feature to be verified by BOO through OEM certification and spec sheet of product. |
| 20 | Power Input Supply 85V to 305V AC  | The Feature to be verified by BOO through OEM certification and spec sheet of product  |
| 21 | <u>Operating Conditions</u> : -40°C to +70°C , 20% to 90% Rh non-condensing.   | The Feature to be verified by BOO through OEM certification and spec sheet of product  |
| 22 | <u>Enclosure</u> : UV treated Poly Carbonate, IP67   | The Feature to be verified by BOO through OEM certification and spec sheet of product  |

**(ii) 7 PIN NEMA RECEPTACLE CONNECTOR FOR FIXING ON TOP LUMINAIRE WITH CUTOUT (REC) :**

| <b>S/ No.</b> | <b>TECHNICAL SPECIFICATION</b>  | <b>TRIAL DIRECTIVES</b>                        |
|---------------|---|--|
| 1             | 7 pin NEMA receptacle connector for fixing on top luminaire.  | System to be physically checked by BOO.        |
| 2             | Facility to fix with clamp on pole.   | System to be physically checked by BOO.        |
| 3             | Compatible with standard luminaire.   | System to be physically checked by BOO.        |
| 4             | Housing: IP 65 compatible   | OEM certification will be provided by the firm |
| 5             | Auto Recovery Relay (for power protection):<br>Under Voltage Protection: 170 VAC<br>Over Voltage Protection : 270 VAC | The Feature to be verified by BOO              |

**(iii) WIRELESS GATEWAY USING GPRS OR ETHERNET (DCU):**

| <b>S/ No.</b> | <b>TECHNICAL SPECIFICATION</b>   | <b>TRIAL DIRECTIVES</b>   |
|---------------|--|---|
| 1             | <u>Processor</u> : 32-bit ARM9 running at 250 MHz.   | The Feature to be verified by BOO through OEM certification and spec sheet of product |
| 2             | <u>Real Time Clock</u> : Battery-backed RTC.   | The Feature to be verified by BOO through OEM certification and spec sheet of product |
| 3             | <u>Radio Communication</u> : 2.4 GHz, IEEE 802.15.4<br><u>Data Rate</u> : 250 kbps Transmit Power: +18 dBm.<br><u>Receiver Sensitivity</u> : -102 dBm<br><u>Network Type</u> : Self-forming mesh network.<br><u>Network Fault Tolerance</u> : Self-healing mesh<br><u>Hardware</u> : CSMA/CA Mechanism.<br><u>Open Field Range</u> : 5000 ft/1.5 km.<br><u>Data Protection</u> : 128-bit/256-bit AES encryption.<br><u>RF Transceiver Certifications</u> : United States (FCC), Canada (IC) and Europe (ETSI). | The Feature to be verified by BOO through OEM certification and spec sheet of product |

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| 4. | <p><u>GSM Characteristics:</u> Quad band 850/900/1800/1900 MHz.</p> <ul style="list-style-type: none"> <li>- GPRS multi-slot class 10.</li> <li>- GPRS coding scheme CS-1 to 4.</li> <li>- Packet data up to 85.6 kbps.</li> <li>- Circuit-switched data up to 14,400 bps transparent and non-transparent.</li> </ul> | The Feature to be verified by BOO through OEM certification and spec sheet of product              |
| 5  | <p><u>Storage Memory:</u> 256 MB XNAND Flash.</p>   | The Feature to be verified by BOO through OEM certification and spec sheet of product              |
| 6  | <p><u>Power:</u> Universal AC input 85-264 VAC, 50/60 Hz.</p>   | System to be physically checked by BOO.  |
| 7  | <p><u>Ports:</u> Ethernet: 10/100 Base-T, RS-232, USB 2 480 M/bits Host (2) / Device (1)</p>  | System to be physically checked by BOO.  |
| 8  | <p><u>Installation:</u> Pole Mount or Wall Mount</p>  | System to be physically checked by BOO.  |
| 9  | <p><u>Enclosure:</u><br/>Dimension: 240 mm x 160 mm x 90 mm<br/>Material: Polycarbonate<br/>Protection: IP 66</p>   | System to be physically checked by BOOS and verified through lab test report for IP 65 compliance. |
| 10 | <p><u>Operating Conditions:</u> -400C to 700C / -400F to 1580F, 20% to 90% Rh non-condensing.</p>   | The Feature to be verified by BOO through OEM certification and spec sheet of product              |
| 11 | <p><u>Surge Protection:</u> Standard: 410 Joule CATB (6kV/3kA).</p>   | The Feature to be verified by BOO through OEM certification and spec sheet of product              |
| 12 | <p>Should have the facility to connect with up to 1000 street light controller.</p>   | The Feature to be verified by BOO through OEM certification and spec sheet of product              |
| 13 | <p>Should have the facility to remotely configure from and easy to use web interface including input and output mapping, polling rates and GPS coordinates.</p>   | The Feature to be verified by BOO through OEM certification and spec sheet of product              |
| 14 | <p>Should have the facility to multiple protocol support as per industrial standard to integrate with other system and network.</p>   | The Feature to be verified by BOO through OEM certification and spec sheet of product              |
| 15 | <p>Should have the facility to Ethernet, cellular and wi-fi.</p>  | System to be physically checked by BOO for multiple connectivity.                                  |

**(iv) HAND HELD UNIT WITH MAINTENANCE TOOL:**

| <b>S/ No.</b> | <b>TECHNICAL SPECIFICATION</b>  | <b>TRIAL DIRECTIVES</b>   |
|---------------|---|---|
| 1             | Eqpt should be a hand held device with facility of 4x6 membrane keypad and 16x2 LCD interface to manage all aspect of installation and maintenance. | System to be physically checked by BOO  |
| 2             | Should have the facility to configure/ commissioning/ fault maintenance of Street Light Controller (SLC).   | System to be physically checked by BOO  |
| 3             | Should have the facility to communicate with (SLC) through a RF link 2.4 GHz (license free band).   | System to be physically checked by BOO and verified the feature through OEM certification |
| 4             | Should have the facility to read all energy parameters like voltage , current , status etc.   | System to be physically checked by BOO  |
| 5             | Should have the facility to write/ reset critical parameters in non-volatile memory.  | System to be physically checked by BOO  |
| 6             | Should have the facility of independent power source with rechargeable battery alongwith suitable battery charger.                                  | System to be physically checked by BOO  |
| 7             | RS232 serial port connectivity for SLC and local command control PC.  | System to be physically checked by BOO  |
| 8.            | Should have capacity of data storage upto 256 KB and program memory of 64 KB.   | BOO to verify the feature through OEM certification / spec sheet                          |

**(v) MCS PC: (OPTIONAL)**

| <b>S/ No.</b> | <b>TECHNICAL SPECIFICATION</b>  | <b>TRIAL DIRECTIVES</b>   |
|---------------|---|---|
| 1             | <u>PROCESSOR</u> : intel / Xeon E3-1225 v5 (3.3 GHz)/ 4 core 8 MHz cache. | System to be physically checked by BOO and verified the parameter through OEM certification |
| 2             | <u>RAM</u> : 8 GB DDR 4 – 2133 MHz (max : 64 Gb)                          | System to be physically checked by BOO and verified the parameter through OEM certification |
| 3             | <u>HDD</u> : 1 TB SATA.   | System to be physically checked by BOO and verified the parameter through OEM certification |
| 4.            | <u>DVD</u> : R/W.   | System to be physically checked by BOO and verified the parameter through OEM certification |
| 5             | <u>USB</u> : 3.0 (4 port).  | System to be physically checked by BOO and verified the parameter through OEM certification |
| 6             | USB 2.0 ( 2 front , 1 internal / one port Ethernet server adaptor).       | System to be physically checked by BOO and verified the parameter through OEM certification |

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| 7  | PCIe G2 full length, full height slots (x4).   | System to be physically checked by BOO and verified the parameter through OEM certification |
| 8  | Digital port only – 01.  | System to be physically checked by BOO and verified the parameter through OEM certification |
| 9  | Standard keyboard and standard optical mouse.  | System to be physically checked by BOO and verified the parameter through OEM certification |
| 10 | Display : 23" LED Monitor.   | System to be physically checked by BOO and verified the parameter through OEM certification |
| 11 | License software : MS Server base OS, MS Office software license, antivirus with SQL 2012 Svr. (1 No. only as server). | System to be physically checked by BOO and verified the parameter through OEM certification |

**(vi) LIGHTNING GALE WEB BASED SOFTWARE WITH LICENSE (LGSWLIC):**

| <b>S/ No.</b> | <b>TECHNICAL SPECIFICATION</b>   | <b>TRIAL DIRECTIVES</b>                                 |
|---------------|--|---|
| 1             | Should have the facility to manage 500 luminaries.   | BOO will verify the parameter through OEM certification |
| 2             | Software support: for 10 years.  | Firm will give under taking                             |
| 3             | Installation and commissioning : included  | Firm will give under taking                             |
| 4.            | Should have the facility to install at centralized location/ server.   | System to be physically checked by BOO                  |
| 5             | Should have the facility to keep all log/ event information in a excel format or similar.  | System to be physically checked by BOO                  |
| 6             | Should have the facility to generate alerts in case of any event/ failure.   | System to be physically checked by BOO                  |
| 7             | Facility of routine updates regarding the health of the system and also any alarm shall also be available to the LOCAL COMMAND AND CONTROL CENTER in the form of SMS.          | System to be physically checked by BOO                  |
| 8             | The system shall be password protected for change/ edit/ deletion of any configuration related information.  | System to be physically checked by BOO                  |
| 9             | Should have the facility to provide email notification on demand.  | System to be physically checked by BOO                  |
| 10            | Should have the facility to configure, monitor, and acquire various types of data such as the Voltage, Current, and Status of the streetlight (i.e. whether it is On or Off) . | System to be physically checked by BOO                  |
| 11            | Should have the facility to give Graphical representation of data fetched.   | System to be physically checked by BOO                  |

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| 12   | Should have the facility to generate alarm Intimation of ( Normal, Low or Critical conditions) of a particular remote site from any location. | System to be physically checked by BOO and the firm submit OEM certificate on the feature. |
| 13   | Should have the facility to control a particular street light from C2.  | System to be physically checked by BOO   |
| 14   | Should have the facility to receive street light status (ON/OFF) at configured interval and display the same on the map layout on the screen. | System to be physically checked by BOO   |
| 15   | Should have the facility display the latest analog/ digital data in maps and graphics received from SLCs.                                     | System to be physically checked by BOO   |
| <b>(vii) MFIP ( Main Feeder Integration Panel) with RTU &amp; Associated components:</b>                                       |   |  |
| <b>TECHNICAL SPECIFICATION</b>   |   | <b>TRIAL DIRECTIVES</b>  |
| <b>RTU (Remote Terminal Unit):</b>   |   |  |
| Ethernet Support : 10/100 Mbps auto detect   |   | System to be physically checked by BOO   |
| Memory :<br>Flash – 512 Kb<br>SRAM – 96 Kb<br>SD Card – 4 Gb   |   | System feature will be verified by the BOO through specs sheet of the eqpt.                |
| Interface : 3 Serial, 1 RS485 & 2 USB  |   | System to be physically checked by BOO   |
| Support : Time stamped DNP 3 and IEC 60870-5 protocol support  |   | System feature will be verified by the BOO through specs sheet of the eqpt.                |
| Interface support (on board): 16 DI, 8 DO & 6 AI.  |   | System to be physically checked by BOO   |
| System should have the facility of : Real Time Monitoring & to register the information with system software.                  |   | System to be physically checked by BOO   |
| System should have the facility of: Alarm Time Stamping  |   | System to be physically checked by BOO   |
| System should have the facility of: 16x2 character display screen with LCD backlight and 4x3 membrane keyboard for data entry. |   | System to be physically checked by BOO   |
| Software support: for 10 years.  |   | Firm will give under taking to provide 10 Yrs software support.                            |



| <b>DETAILS OF ASSOCIATED EQUIPMENTS AND ACCESSORIES:</b>  |  |
|---|--|
| Suitable size Indoor MS Powder coated enclosure with stand (Reputed brand).   | To be physically checked by BOO        |
| 100 A 3 Pole contactor with NO add ON contact ( of reputed brand L&T/SCHNEIDER/SIEMENS )  | System to be physically checked by BOO |
| L/R/OFF SELECTOR SWITCH cat no. 61069 (of reputed brand SALZER/KAYCEE)  | To be physically checked by BOO        |
| 24 V DC RELAY WITH BASE, 2 C/O (of reputed brand OMRON/BCH/IDEC)  | To be physically checked by BOO        |
| 220VAC, Relay, with Base , 2 CO (of reputed brand OMRON/BCH/IDEC)   | To be physically checked by BOO        |
| Auto recovery over and under voltage relay of reputed brand.  | To be physically checked by BOO        |
| 3 PH, 4 WIRE SPD, 10 kA of reputed brand  | To be physically checked by BOO        |
| 240 SQ MM INCOMER TERMINAL/BUS BAR of reputed brand   | To be physically checked by BOO        |
| 240 SQ MM out COMER TERMINAL/BUS BAR of reputed brand   | To be physically checked by BOO        |
| <b>The firm will produce all the above items fitted in a single Indoor MS Powder coated enclosure with stand (Reputed brand) during time of evaluation.</b> |  |

**Note:** - All Firms are requested to comment upon the above mentioned QRs & TD by \_\_\_Jan' 2019.

BOO has decided to upload QRs &TD on CPPP & BSF website for 10 days to invite the views/comments/suggestions from prospective bidders.

(Sanjeev Kumar)  
Commandant (C-Eqpt)